

WHAT IS CLAIMED IS:

- 1 1. A method for distribution of a formatted data file having metadata and
2 content in a system capable of point-to-multipoint communications, the method
3 comprising:

4 transmitting the data file from a sender to a plurality of receivers via a
5 point-to-multipoint session;

6 retransmitting the metadata from the sender to the plurality of receivers
7 via the point-to-multipoint session;

8 wherein retransmission of the metadata can occur at any time during
9 the point-to-multipoint session.
- 1 2. The method of claim 1, wherein transmitting the data file further
2 comprising transmitting the metadata at an earlier time location in the point-to-
3 multipoint session than it they occur in the formatted data file.
- 1 3. The method of claim 1, wherein retransmitting the data file further
2 comprises first transmitting the metadata and then transmitting the content.
- 1 4. The method of claim 1, wherein retransmitting the metadata occurs
2 after transmitting the content.
- 1 5. The method of claim 1, wherein retransmitting the metadata comprises
2 retransmitting the metadata a plurality of times.
- 1 6. The method of claim 1, wherein the formatted data file is transmitted
2 in discrete packets each packet having a Source Block Number (SBN) and an
3 Encoding Symbol Identifier (ESI), wherein the sender retransmits packets containing

4 metadata with the same SBN and ESI as corresponding originally transmitted
5 metadata packets.

1 7. The method of claim 1, wherein the formatted data file and the
2 retransmitted metadata are assigned different Transport Object Identifier (TOI)
3 values.

1 8. The method of claim 1, wherein the plurality of receivers are informed by
2 the sender that metadata repetition will be supported in the point-to-multipoint
3 session.

1 9. The method of claim 8, wherein the sender informs the receivers that
2 metadata repetition will be supported via Session Description Protocol (SDP) using a
3 metadata repetition attribute.

1 10. The method of claim 9 wherein the metadata repetition attribute is
2 communicated to the receivers as follows: a=metadata-repetition ("uri =
3 <">URI<">)/(<*>))[",repetitions =" %d] wherein URI is defined in RFC 2396 and %d
4 is the number of repetitions.

1 11. The method of claim 1, further comprising using an FEC repair scheme
2 in conjunction with metadata repetition.

1 12. The method of claim 1, further comprising using a point-to-point repair
2 scheme in conjunction with metadata repetition.

1 13. A method for distribution of a formatted data file having metadata and
2 content in a system capable of point-to-multipoint communications, the method
3 comprising:

4 transmitting the data file from a sender to a plurality of receivers via a
5 point-to-multipoint session; and
6 using FEC to allocate more redundancy to the metadata than is
7 allocated to the content.

1 14. The method of claim 13 wherein FEC is used for only the metadata.

1 15. A method for distribution of a formatted data file having metadata and
2 content in a system capable of point-to-multipoint communications, the method
3 comprising:

4 transmitting the data file from a sender to a plurality of receivers via a
5 point-to-multipoint session; and using point-to-point data repair to repair errors in
6 receipt of metadata wherein the receivers are restricted such that they can request
7 metadata but not content via point-to-point repair.

1 16. A method for distribution of a formatted data file having metadata and
2 content in a system capable of point-to-multipoint communications, the method
3 comprising:

4 transmitting the data file from a sender to a plurality of receivers via a
5 point-to-multipoint session; and using point-to-point data repair to repair errors in
6 receipt of metadata wherein the sender is restricted such that it can send metadata but
7 not content via point-to-point repair.

1 17. A method for decreasing latency in playback of a formatted data file
2 including metadata and content, the method comprising:

3 identifying all metadata in the formatted data file; and

4 transmitting the identified metadata to a plurality of receivers at an
5 earlier time location than they occur in the original formatted data file in a point-to-
6 multipoint transmission.

1 18. The method of claim 17 further comprising transmitting the metadata
2 to the plurality of receivers at the beginning of the point-to-multipoint session and
3 after transmitting all metadata, transmitting the content to the plurality of receivers via
4 the point-to-multipoint transmission session.

1 19. A system for distributing formatted data files having metadata and
2 content via a point-to-multipoint session, the system comprising:

3 a sender device; and

4 a plurality of receiver devices;

5 wherein the sender device is configured to transmit the formatted data
6 file to the plurality of receiver devices via the point-to-multipoint session; and

7 wherein the sender device is configured to retransmit the metadata to
8 the plurality of receiver devices via the point-to-multipoint session at any time during
9 the point-to-multipoint session.

1 20. The system of claim 19 wherein the sender device is further configured
2 to transmit the metadata at an earlier time location in the point-to-multipoint session
3 than it they occur in the formatted data files.

1 21. The system of claim 19 wherein the sender device is further configured
2 to first transmit the metadata and then transmit the content of the formatted data file.

1 22. The system of claim 19 wherein the sender device is further configured
2 to retransmit the metadata to the plurality of receiver devices via the point-to-
3 multipoint session a plurality of times.

1 23. The system of claim 19 wherein the sender device is configured to
2 inform the plurality of receiver devices that metadata repetition will be supported in
3 the point-to-multipoint session.

1 24. The system of claim 23, wherein the sender device is configured to
2 inform the receivers that metadata repetition will be supported via Session
3 Description Protocol (SDP) using a metadata repetition attribute.

1 25. The system of claim 24 wherein the metadata repetition attribute is
2 communicated to the receiver devices as follows: a=metadata-repetition (“uri =
3 <”>URI<”>)/(<*>))[“,repetitions =” %d] wherein URI is defined in RFC 2396 and %d
4 is the number of repetitions.

1 26. The system of claim 19 further comprising means for implementing an
2 FEC repair scheme in conjunction with metadata repetition.

1 27. The system of claim 19 further comprising means for implementing a
2 point-to-point repair scheme in conjunction with metadata repetition.

1 28. A system for distributing formatted data files having metadata and
2 content via a point-to-multipoint communications session, the system comprising:

3 a sender device; and
4 a plurality of receiver devices;
5 wherein the sender device is configured to use FEC to allocate more
6 redundancy to the metadata than is allocated to the content.

1 29. The system of claim 28 wherein FEC is used for only the metadata.

1 30. A system for distributing formatted data files having metadata and
2 content via a point-to-multipoint communications session, the system comprising:

3 a sender device; and
4 a plurality of receiver devices;
5 wherein the sender device is configured to use point-to-point data
6 repair to repair errors in receipt of metadata; and
7 wherein the receiver devices are restricted such that they can request
8 metadata but not content via point-to-point repair.

1 31. A system for distributing formatted data files having metadata and
2 content via a point-to-multipoint communications, the system comprising:

3 a sender device;
4 a plurality of receiver devices;
5 wherein the sender device is configured to use point-to-point data
6 repair to repair errors in receipt of metadata;
7 and wherein the sender device is restricted such that it can send
8 metadata but not content via point-to-point repair.

1 32. A system for decreasing latency in playback of a formatted data file
2 having metadata and content, the system comprising:

3 a sender device; and

4 a plurality of receiver devices;

5 wherein the sender device is configured for identifying all metadata in
6 a formatted data file and transmitting the identified metadata to the plurality of
7 receiver devices at an earlier time location than they occur in the formatted data file in
8 a point-to-multipoint transmission session.

1 33. The system of claim 32 wherein the sender device is configured to
2 transmit the metadata to the plurality of receiver devices at the beginning of the a
3 point-to-multipoint transmission session before transmitting the content of the
4 formatted data file to the plurality of receiver device.

1 34. A sender device for use in a system for distributing formatted data files
2 having metadata and content, the sender device comprising:

3 means for sending a formatted data file to a plurality of receiver
4 devices via a point-to-multipoint session;

5 means for retransmitting the metadata of the formatted data file to the
6 plurality of receiver devices via a point-to-multipoint session;

7 wherein retransmission of the metadata can occur at any time during
8 the point-to-multipoint session.

1 35. The sender device of claim 34 further comprising means for
2 identifying all metadata in the formatted data file, wherein the means for sending is
3 configured to send all of the metadata to the plurality of receiver devices at an earlier
4 time location than they occur in the formatted data file.

1 36. The sender device of claim 35 wherein the sender device is configured
2 to transmit all of the metadata to the plurality of receiver devices before beginning to
3 send the content of the formatted data file to the plurality of receiver devices.

1 37. The sender device of claim 34 wherein the means for retransmitting is
2 configured to retransmit the metadata to the plurality of receiver devices via the point-
3 to-multipoint session a plurality of times.

1 38. The sender device of claim 34 wherein the sender device further
2 includes means for informing the plurality of receiver devices that metadata repetition
3 will be supported in the point-to-multipoint session.

1 39. The sender device of claim 38, wherein the sender device is configured
2 to inform the receiver devices that metadata repetition will be supported via Session
3 Description Protocol (SDP) using a metadata repetition attribute.

1 40. The sender device of claim 39 wherein the metadata repetition attribute
2 is communicated to the receiver devices as follows: a=metadata-repetition (“uri =
3 <”>URI<”>)/(<*”>))[“,repetitions =” %d] wherein URI is defined in RFC 2396 and %d
4 is the number of repetitions.

1 41. The sender device of claim 34 further comprising means for
2 implementing an FEC repair scheme in conjunction with metadata repetition.

1 42. The sender device of claim 34 further comprising means for
2 implementing a point-to-point repair scheme in conjunction with metadata repetition.

1 43. A sender device for use in a system for distributing formatted data files
2 having metadata and content, the sender device comprising:

3 means for sending a formatted data file to a plurality of receiver
4 devices via a point-to-multipoint session;

5 means for implementing FEC to allocate more redundancy to the
6 metadata than is allocated to the content.

1 44. The sender device of claim 43 wherein the means for implementing is
2 configured to use FEC only for the metadata.

1 45. A sender device for use in a system for distributing formatted data files
2 having metadata and content, the sender device comprising:

3 means for sending a formatted data file to a plurality of receiver
4 devices via a point-to-multipoint session;

5 means for implementing point-to-point data repair to repair errors in
6 receipt of metadata wherein means for sending is restricted such that it can send
7 metadata but not content via point-to-point repair.

1 46. A computer code product comprising:

2 computer code configured to:

3 transmit a formatted data file including metadata and content from a
4 sender device to a plurality of receiver devices via a point-to-multipoint session;

5 retransmit the metadata to the plurality of receiver devices via the
6 point-to-multipoint session at any time during the point-to-multipoint session.

1 47. The computer code product of claim 46 further comprising computer
2 code configured to transmit the metadata of the formatted data file at an earlier time
3 location than they occur in the original formatted data file.

1 48. The computer code product of claim 47 wherein the computer code is
2 configured to transmit the metadata of the formatted data file before transmitting the
3 content of the formatted data file.

1 49. The computer code product of claim 46 further comprising computer
2 code configured to retransmit the metadata after first transmitting the metadata and
3 content of the formatted data file.

1 50. The computer code product of claim 46 wherein the computer code is
2 configured to retransmit the metadata a plurality of times.

1 51. The computer code product of claim 46 wherein the computer code is
2 configured to inform the plurality of receiver devices that metadata repetition will be
3 supported in the point-to-multipoint session.

1 52. The computer code product of claim 51, wherein the computer code is
2 configured to inform the receiver devices that metadata repetition will be supported
3 via Session Description Protocol (SDP) using a metadata repetition attribute.

1 53. The method of claim 52 wherein the metadata repetition attribute is
2 communicated to the receiver devices as follows: a=metadata-repetition ("uri =
3 <">URI<">)/(<*>))[",repetitions =" %d] wherein URI is defined in RFC 2396 and %d
4 is the number of repetitions.

1 54. The computer code product of claim 46 wherein the computer code is
2 further configured to implement an FEC repair scheme in conjunction with metadata
3 repetition.

1 55. The computer code product of claim 46 wherein the computer code is
2 further configured to implement a point-to-point repair scheme in conjunction with
3 metadata repetition.

1 56. A computer code product comprising:

2 computer code configured to:

3 transmit a formatted data file including metadata and content from a
4 sender device to a plurality of receiver devices via a point-to-multipoint session; and

5 use FEC to allocate more redundancy to the metadata than is allocated
6 to the content.

1 57. The computer code product of claim 56 wherein FEC is used for only
2 the metadata.

1 58. A computer code product comprising:

2 computer code configured to:

3 transmit a formatted data file including metadata and content from a
4 sender device to a plurality of receiver devices via a point-to-multipoint session; and
5 use point-to-point data repair to repair errors in receipt of metadata
6 wherein the receiver devices are restricted such that they can request metadata but not
7 content via point-to-point repair

1 59. A computer code product comprising:

2 computer code configured to:

3 transmit a formatted data file including metadata and content from a
4 sender device to a plurality of receiver devices via a point-to-multipoint session; and
5 use point-to-point data repair to repair errors in receipt of metadata
6 wherein the sender device is restricted such that it can send metadata but not content
7 via point-to-point repair.

1 60. A computer code product comprising:

2 computer code configured to:

3 identify all metadata in a formatted data file including metadata and
4 content; and

5 transmit the identified metadata at an earlier time location than they
6 occur in the formatted data file in a point-to-multipoint transmission session.

1 61. The computer code product of claim 60 comprising computer code
2 configured to transmit the identified metadata at the beginning of a point-to-
3 multipoint transmission session before transmission of the content.